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DESCRIPTION: **Combined Modification Document –  
Modification Note 83  
TCTO 31P1-4-108-633  
Upgrade RPG Hardware and Software  
for Digital Communications**

DATE OF ISSUE: October 19, 2004

QUANTITY OF ISSUE: EACH



**UPGRADE RPG HARDWARE AND SOFTWARE FOR  
DIGITAL COMMUNICATIONS**

**DOPPLER METEOROLOGICAL RADAR  
WSR-88D**



DoD Distribution Statement A - Approved for public release; distribution is unlimited.

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COMMERCE, THE AIR FORCE, THE NAVY, AND TRANSPORTATION

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**NWS APPROVAL:**

**Mark S. Paese**

Digitally signed by Mark S. Paese  
DN: CN = Mark S. Paese, C =  
US, OU = DOC/NOAA/NWS  
Date: 2004.10.21 13:59:35 -05'00'

**Date** \_\_\_\_\_

**Mark S. Paese**  
**Director, Maintenance, Logistics**  
**and Acquisition Division**

**DoD APPROVAL:**

**BY ORDER OF THE SECRETARY OF THE AIR FORCE**

*Edward L. Berkowitz*

Digitally signed by Ed Berkowitz  
DN: CN = Ed Berkowitz, C = US,  
O = ROC, OU = Program Branch  
Date: 2004.10.21 13:28:25 -05'00'

**JOHN P. JUMPER, General, USAF**  
**Chief of Staff**

**Date** \_\_\_\_\_

**Edward L. Berkowitz, Chief**  
**Program Branch**  
**Radar Operations Center**  
**TOMA**

**NWS: EHB-6, Modification Note 83**  
**DoD: AFTO 31P1-4-108-633**

**1. SUBJECT**

Upgrade Radar Product Generator (RPG) Hardware and Software for Digital Communications.

**2. PURPOSE**

This modification installs the necessary RPG hardware and software to use digital telecommunications for NWS and DoD radars and their non associated NWS WFOs. Digital telecommunications will support the maximum Routine Product Set (RPS) from the NWS and DoD radars to the non associated NWS WFO. These circuits are sometimes referred to as supplemental or secondary connections. The authority for this modification is Radar Operations Center (ROC) Engineering Change Proposal (ECP) 0177R1, Remaining AWIPS to WSR-88D 14.4 Analog Connections.

RPG Software Build 5 (NWS Software Note 24, DoD AF TO 31P1-4-108-618, and FAA Order 6345.1 CHG 49, Chap 45) (for NWS radars not previously supporting digital NEXRAD communications) will need to be installed by the site before the ROC installation team arrives to perform this retrofit. The installation team will install the software for the DoD or NWS RPG router. There will be 30 to 45 minutes during digital communications installation when no data is flowing from the NWS radar and/or DoD radar to AWIPS. This is because the WSR-88D RPG routers will need to be powered down while new hardware and software is being installed.

AWIPS Open Build 3 has to be installed to take full advantage of this change. If AWIPS Open Build 3 is not installed, AWIPS will continue to obtain data from the DoD radar or NWS via the existing dedicated circuits. Once AWIPS Open Build 3 is available, the AWIPS system administrator will be provided instructions on configuring the AWIPS to obtain a full RPS from the non associated NWS or DoD radar.

This modification will be coordinated to minimize data loss at each site. Limited RPG downtime is anticipated while this modification is being performed. At DoD radars, the RPGs routers will be taken offline for approximately 45 minutes. At NWS WFOs, the NWS RPGs will be taken offline for approximately 30 minutes. If there is a problem with the digital communications service, contact the ROC Hotline for assistance in converting back to analog telecommunications.

For additional information concerning this document, contact the Radar Operations Center (ROC) Hotline, Norman, OK; phone number: (800) 643-3363 or (405) 573-8900 or by e-mail at [NEXRAD.Hotline@noaa.gov](mailto:NEXRAD.Hotline@noaa.gov). An electronic copy of this document can be found at the following Internet address:  
[www.roc.noaa.gov/ssb/sysdoc/techman/tmlinks.asp](http://www.roc.noaa.gov/ssb/sysdoc/techman/tmlinks.asp)

**3. SITES AFFECTED**

See ATTACHMENT 1.

**4. ESTIMATED COMPLETION DATE**

This modification must be reported completed no later than 60 days after the completion of the installation by the ROC.

**5. EQUIPMENT AFFECTED**

Radar Product Generator Group.

**6. SPARES AFFECTED**

Not applicable.

**7. MODIFICATION ACCOMPLISHED BY**

A team from the ROC will perform all hardware and software installations.

**8. MATERIAL REQUIRED**

The materials required for this modification will be supplied by the ROC team performing the modification.

**9. SOURCE OF MATERIALS**

Kits are requisitioned by the ROC Retrofit Management Team and shipped at no cost to the site.

**10. SPECIAL TOOLS AND TEST EQUIPMENT REQUIRED**

Not applicable.

**11. TIME AND PERSONNEL REQUIRED**

Work Phases	Work-hours
Unpacking	0.5
Disassembly	0.25
Installation	0.25
Assembly	0.0
Operational Check	0.5
Total Work-hours	1.5

**12. DOCUMENTS AFFECTED**

**a. Technical Manual, System Description, Revision 4, dated 31 March 2003.**

NWS: EHB 6-500, Change 1

DoD: AF TO 31P1-4-108-1, Change 1

FAA: TI 6345.1 V1, Change 1

Navy: EM 400-AA-MMM-010/WSR88D, Change 1

**b. Technical Manual, Illustrated Parts Breakdown (IPB), Revision 7, dated 31 October 2003.**

NWS: EHB 6-501, Change 1

DoD: AF TO 31P1-4-108-4, Change 1

FAA: TI 6345.1 V2, Change 1

Navy: EM 400-AB-IPB-010, Change 1

**c. Technical Manual, Work Unit Code, Revision 1, dated 1 November 2001.**

NWS: EHB 6-502, Change 3

DoD: AF TO 31P1-4-108-06, Change 3

FAA: TI 6345.1 V3, Change 3

Navy: EM 400-AC-WUC-010, Change 3

**d. Technical Manual, Inspection, Lubrication, and Maintenance Requirements, Revision 2, dated 1 June 2002.**

NWS: EHB 6-503, Change 3

DoD: AF TO 31P1-4-108-6, Change 3

FAA: TI 6345.1 V4, Change 3

Navy: EM 400-AM-MOO-010, Change 3

**e. Technical Manual, Preventive Maintenance Inspection Work Cards, Revision 3, dated 15 May 2002.**

NWS: EHB 6-503-2, Change 2

DoD: AF TO 31P1-4-108-6WC-8, Change 2

FAA: TI 6345.1 V4, Change 2

**f. Maintenance Instructions, Radar Product Generator (RPG), Revision 1, dated 30 April 2003.**

NWS: EHB 6-525, Change 2

DoD: AF TO 31P1-4-108-452-1, Change 2

FAA: TI 6345.1 V49, Change 2

**g. Operations Instructions, Radar Product Generation (RPG), Revision 2, dated 29 March 2004.**

NWS: EHB 6-526

DoD: AF TO 31P1-4-108-451-1

FAA: TI 6345.1 V50

**13. VERIFICATION STATEMENT**

This modification was successfully installed at the Radar Operations Center.

**14. DISPOSITION OF REMOVED AND REPLACED PARTS/MATERIALS**

Parts removed (cable W340) at the site should be maintained by the site to reinstall in the event of a problem with digital communications service. For a short period of time, analog service will remain activated and in the event of an emergency, the site could revert to using dedicated modem to modem connections. This would need to be coordinated with the ROC.

The Original Equipment Manufacturer (OEM) containers should be maintained by the site to re-ship the Cisco 2621XM Router in the event of a router failure. The router assembly, versus modular components, is considered one Line Replaceable Unit (LRU).

**15. PROCEDURES**

Not applicable.

**16. FAA DISTRIBUTION**

Not applicable.

**17. CHANGES TO TABLE OF CONTENTS (FAA)**

Not applicable.

**18. RECOMMENDATIONS FOR CHANGES (FAA)**

Not applicable.



## **19. REPORTING INSTRUCTIONS**

### **a. NWS**

Report completed modification on WS Form A-26, Engineering Management Reporting System Maintenance Record, according to the instructions in NWS Instruction (NWSI) 30-2104, Engineering Management Reporting System (EMRS), part 2 and Appendix E. Include the following information on the WS Form A-26:

- An Equipment Code of RPG in Block 7.
- The appropriate serial number in Block 8.
- A Mod No. of 83 in Block 17a.

A sample EMRS report is provided as ATTACHMENT 3.

### **b. DoD**

Update the AFTO Form 95 to show TCTO compliance. Report TCTO compliance in accordance with TO 00-20-2, Table 3-10, Rule 9.

Complete [ATTACHMENT 2](#), and return the information to the ROC by one of the four methods below:

- |                     |   |
|---------------------|---|
| (1) Mail Address:   | Program Branch, Retrofit Management Team<br>WSR-88D Radar Operations Center<br>3200 Marshall Ave., Suite 101<br>Norman, Oklahoma 73072-8028 |
| (2) Fax Number:     | (405) 573-3480<br>ATTN: Retrofit Management Team  |
| (3) E-mail Address: | <a href="mailto:NEXRAD.Logistics@noaa.gov">NEXRAD.Logistics@noaa.gov</a>  |
| (4) Web Version:    | <a href="http://www.roc.noaa.gov/ssb/logistics/completion.asp">http://www.roc.noaa.gov/ssb/logistics/completion.asp</a>                     |



ATTACHMENT 1

EFFECTIVITY

NWS

NEXRAD Site Name	City, ST	EQP	SID	ORG Code
Eastern Region				
BUFFALO	BUFFALO, NY	RPG	BUF	WN9528
CLEVELAND	CLEVELAND, OH	RPG	CLE	WN9524
PHILADELPHIA	MOUNT HOLLY, NJ	RPG	PHI	WN9950
STATE COLLEGE	STATE COLLEGE, PA	RPG	CTP	WN9925
STERLING	STERLING, VA	RPG	LWX	WN9931
Southern Region				
BIRMINGHAM	ALABASTER, AL	RPG	BMX	WP9957
DALLAS/FT WORTH	FORT WORTH, TX	RPG	FWD	WP9259
JACKSON/BRANDON, MS	JACKSON, MS	RPG	JAN	WP9235
KEY WEST	BOCA CHICA KEY, FL	RPG	EYW	WP9201
KNOXVILLE	MORRISTOWN, TN	RPG	MRX	WP9325
LITTLE ROCK	NORTH LITTLE ROCK, AR	RPG	LZK	WP9340
MEMPHIS	MEMPHIS, TN	RPG	MEG	WP9334
MIAMI	MIAMI, FL	RPG	MFL	WP9918

ATTACHMENT 1 (Continued)

EFFECTIVITY

NEXRAD Site Name	City, ST	EQP	SID	ORG Code
MOBILE	MOBILE, AL	RPG	MOB	WP9223
NASHVILLE	OLD HICKORY, TN	RPG	OHX	WP9327
NORTHEAST ALABAMA	HUNTSVILLE, AL	RPG	HUN	WP9914
SHREVEPORT	SHREVEPORT, LA	RPG	SHV	WP9248
TALLAHASSEE	TALLAHASSEE, FL	RPG	TAE	WP9214
WESTERN ARKANSAS	TULSA, OK	RPG	TSA	WP9356
Central Region				
DENVER	BOULDER, CO	RPG	BOU	WR9469
GRAND JUNCTION	GRAND JUNCTION, CO	RPG	GJT	WR9476
LOUISVILLE	LOUISVILLE, KY	RPG	LMK	WR9423
PADUCAH	PADUCAH, KY	RPG	PAH	WR9957
PLEASANT HILL	PLEASANT HILL, MO	RPG	EAX	WR9446
Western Region				
SALT LAKE CITY	SALT LAKE CITY, UT	RPG	SLC	WT9932
CEDAR CITY	SALT LAKE CITY, UT	RPG	SLC	WT9932
FLAGSTAFF	BELLEMONT, AZ	RPG	FGZ	WT9375
LOS ANGELES	OXNARD, CA	RPG	LOX	WT9295

ATTACHMENT 1 (Continued)

EFFECTIVITY

NEXRAD Site Name	City, ST	EQP	SID	ORG Code
SANTA ANA MTS	SAN DIEGO, CA	RPG	SGX	WT9918
Miscellaneous				
TRAINING CENTER #1 NWSTC	KANSAS CITY, MO	RPG	TTCM7	WB9612
DoD				
ANDERSEN AFB	ANDERSEN AFB, GU	RPG	UAM	FE5240
COLUMBUS AFB	GREENWOOD SPRINGS, MS	RPG	GWX	FE3022
DOVER AFB	ELLENDALE STATE FOREST, DE	RPG	DOX	FE4497
DYESS AFB	MORAN, TX	RPG	DYX	FE4661
EGLIN AFB	RED BAY, FL	RPG	EVX	FE2823
FT DRUM	MONTAGUE, NY	RPG	TYX	FY4846



ATTACHMENT 2

DIGITAL COMMUNICATION HARDWARE AND SOFTWARE MODIFICATION COMPLETION FORM

\*\*\*\*\* **DoD Only will complete and return this form** \*\*\*\*\*  
**NWS report completion through EMRS**

Site Name: \_\_\_\_\_

Site Identifier: \_\_\_\_\_

Total Time to Complete this Modification Document: \_\_\_\_\_

Technician's Name(s): \_\_\_\_\_

Technician's Phone Number: \_\_\_\_\_

Date Completed: \_\_\_\_\_

Circuit Number: \_\_\_\_\_

Problem(s) Encountered:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Upon completion of this form, return the information to the ROC using one of the four methods below:

1. Mailing Address: Program Branch, Retrofit Management Team  
WSR-88D Radar Operations Center  
3200 Marshall Ave., Suite 101  
Norman, OK 73072-8028
2. FAX Number: (405) 573-3480  
ATTN: Retrofit Management Team
3. E-mail Address: [NEXRAD.Logistics@noaa.gov](mailto:NEXRAD.Logistics@noaa.gov)
4. Web Version: <http://www.roc.noaa.gov/ssb/logistics/complete/>





# ATTACHMENT 3

A26 Detail Form - ESCM2, SILVER SPRING, MD :: JOHN MERHI - Microsoft Internet Explorer									
<a href="#">New A26</a> <a href="#">Commit A26</a> <a href="#">Place on Hold</a> <a href="#">Copy A26</a> <a href="#">Delete A26</a> <a href="#">Detail Report</a> <a href="#">Document Summary</a> <a href="#">Help</a>									
<b>GENERAL INFORMATION</b>									
<input type="button" value="NEW RECORD"/>		WFO* <input type="text" value="HUN"/>		Document No.* <input type="text" value="HUN41013000"/>					
1. Open Date	Open Time	2. Op Initials	3. Response Priority		4. Close Date	Close Time			
<input type="text" value="10/13/2004"/>	<input type="text" value="08:00"/>	<input type="text" value="WSH"/>	<input type="radio"/> Immediate <input type="radio"/> Low <input type="radio"/> Routine <input checked="" type="radio"/> Not Applicable		<input type="text" value="10/13/2004"/>	<input type="text" value="09:30"/>			
5. Maintenance Description <input type="text" value="419"/> characters left <span style="float: right;">RADAR, WSR-88D</span>									
<input type="text" value="Assist ROC team with RPG hardware and software upgrade for Digital Communications"/>									
<b>EQUIPMENT INFORMATION</b>									
6. Station ID*	7. Equipment Code	8. Serial Number			9. TM	10. AT	11. How Mal		
<input type="text" value="HUN"/>	<input type="text" value="RPG"/>	<input type="text" value="DC180"/>			<input type="text" value="M"/>	<input type="text" value="M"/>	<input type="text" value="999"/>		
<b>Alert:</b> <span style="color: blue;">Time Remaining:</span> <span style="color: red;">0:00</span> <span style="color: blue;">(For Block 12 use only)</span>									
<b>12. EQUIPMENT OPERATIONAL STATUS TIMES</b>									
<b>a. Fully Operational</b>		<b>b. Logistic Delay</b>		<b>c. All Other</b>		<b>d. Logistic Delay</b>		<b>e. All Other</b>	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="30"/>
<b>13. PARTS USAGE and CONFIGURATION MANAGEMENT REPORTING</b>									
ASN	Vendor Part No. (New Part)	Serial Number (Old Part)	Serial Number (New Part)	<input type="button" value="New Row"/>					
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Delete Row"/>					
<b>14. WORKLOAD INFORMATION</b>									
<b>a. Routine</b>		<b>b. Non-Routine</b>		<b>c. Travel</b>		<b>d. Misc</b>		<b>e. Overtime</b>	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="1"/>	<input type="text" value="30"/>	<input type="text"/>	<input type="text"/>
<b>MISCELLANEOUS INFORMATION</b>									
15. Maintenance Comments <input type="text" value="650"/> characters left									
<input type="text" value="Assisted the ROC installation team with RPG hardware and software upgrade for Digital Communications"/>									16. Tech Initials
									<input type="text" value="BLB"/>
<b>17. SPECIAL PURPOSE REPORTING INFORMATION</b>									
a. Mod No.	b. Mod Act/Deact Date	c. Block C	d. Trouble Ticket No.	e. Block E					
<input type="text" value="83"/>	<input type="text" value="10/13/2004"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>					

